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for Exploration Systems
Human Exploration and Operations Mission Directorate |
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Marshall Space Flight Center |
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Marshall Space Flight Center |
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Marshall Space Flight Center |
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Space Launch System (SLS) Program Overview NASA Research Announcement (NRA) Advanced Booster (AB) Engineering Demonstration and Risk Reduction (EDRR) Industry Day



Space Launch System



Todd A. May, SLS Program Manager
NASA Marshall Space Flight Center
December 15, 2011

NASA Authorization Act of 2010



- ◆ **The Congress approved and the President signed the National Aeronautics and Space Administration Authorization Act of 2010.**
 - Bipartisan support for human exploration beyond low-Earth orbit (LEO)

- ◆ **The Law authorizes:**
 - Extension of the International Space Station (ISS) until at least 2020
 - Strong support for a commercial space transportation industry
 - **Development of Orion Multi-Purpose Crew Vehicle (MPCV) and heavy lift launch capabilities**
 - A “flexible path” approach to space exploration, opening up vast opportunities including near-Earth asteroids and Mars
 - New space technology investments **to increase the capabilities beyond Earth orbit (BEO)**



This rocket is key to implementing the plan laid out by President Obama and Congress in the bipartisan 2010 NASA Authorization Act.

— NASA Administrator Charles Bolden
September 14, 2011



Delivering on the Laws of the Land ... and Obeying the Laws of Physics

SLS Is a National Asset for Multiple Stakeholders and Partners



SLS Driving Objectives



◆ Safe: Human-Rated

◆ Affordable

- Constrained budget environment
- Maximum use of common elements and existing assets, infrastructure, and workforce
- Competitive opportunities for affordability on-ramps



◆ Initial capability: 70 metric tons (t), 2017–2021

- Serves as primary transportation for Orion and exploration missions
- Provides back-up capability for crew/cargo to ISS

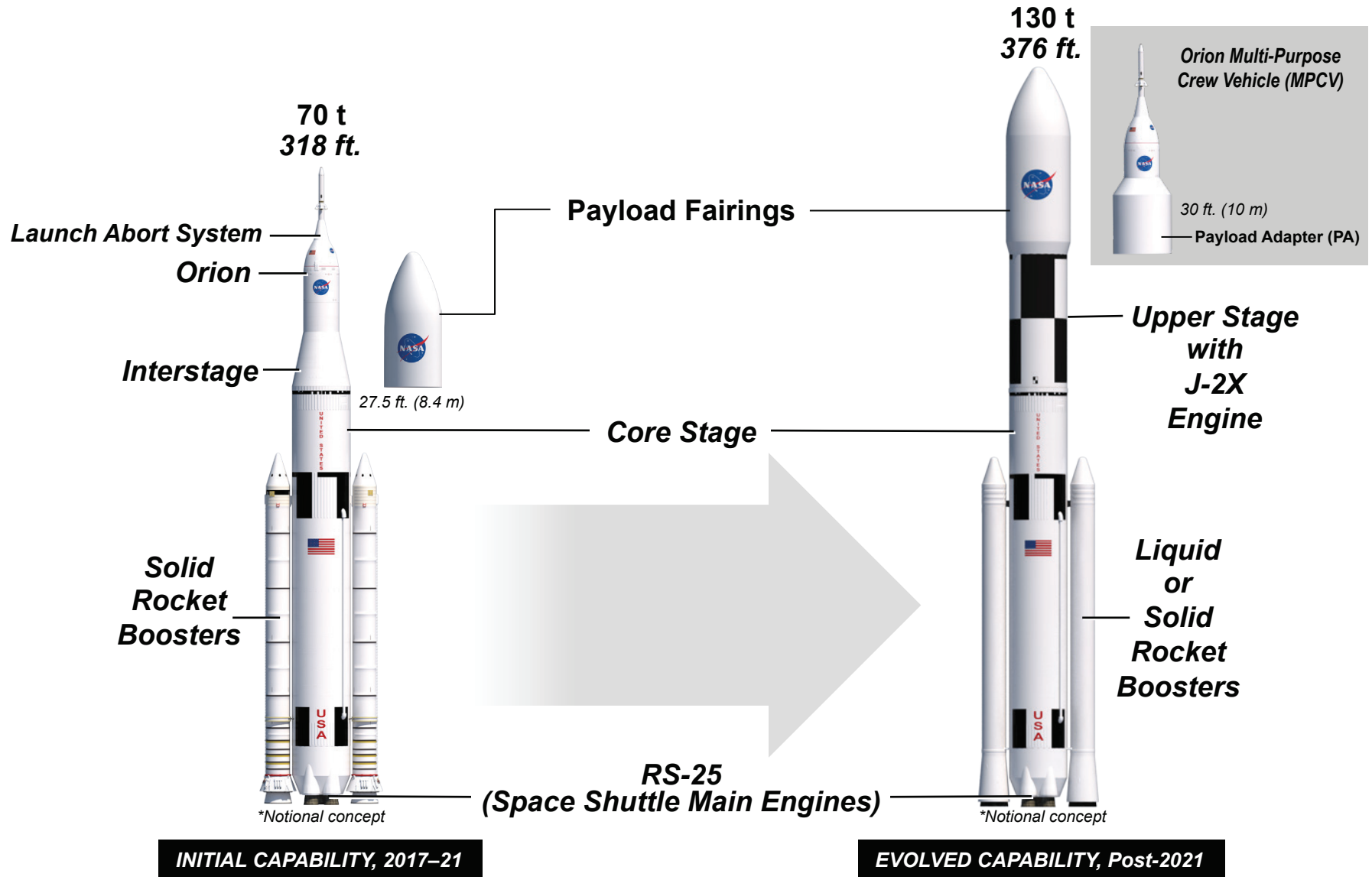
◆ Evolved capability: 130 t, post–2021

- Offers large volume for science missions and payloads
- Modular and flexible, right-sized for mission requirements



SLS First Flight in 2017

SLS Architecture Uses Existing and Advanced Technologies to Fly in 2017



Built in the U.S.A.

SLS Maximizes U.S. Aerospace Workforce and Capabilities



◆ Boosters (3-phased approach)

- Phase I: 5-segment Solid Rocket Booster in-scope modification to existing Ares contract with ATK for initial flights through 2021
- Phases II and III: Advanced Boosters
 - II: Engineering demonstration and risk reduction via NASA Research Announcement (NRA): Full and Open Competition in FY12; award by FY13
 - III: Design, Develop, Test, & Evaluation (DDT&E): Full and Open Competition (RFP target FY15)

◆ Stages

- Core/Upper Stage: Justification for Other Than Full and Open Competition (JOFOC) to Boeing, modifying current Ares Upper Stage contract
- Instrument Unit Avionics: In-scope modification to existing Ares contract with Boeing; consolidated with Stages contract to Boeing

◆ Engines

- Core Stage Engine: RS-25 JOFOC to existing Space Shuttle contract with Pratt & Whitney Rocketdyne (PWR)
- Upper Stage Engine: J-2X in-scope modification to existing Ares contract with PWR
- Future Core Stage Engine: Separate contract activity to be held in the future

◆ Spacecraft and Payload adapter and Fairing

- Initial design:
 - Adapter and Fairing design and development in-house through early design phase
- Fairing Full and Open Competition planned for FY13



INITIAL

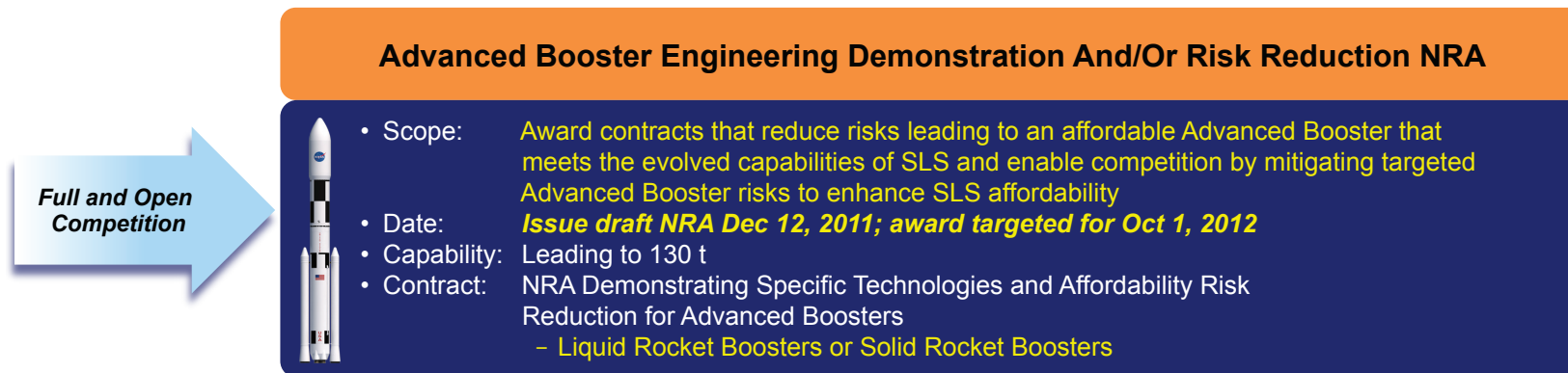


EVOLVED

***Delivers Near-Term Initial Capabilities
and Spurs Competition for Evolved Capabilities***



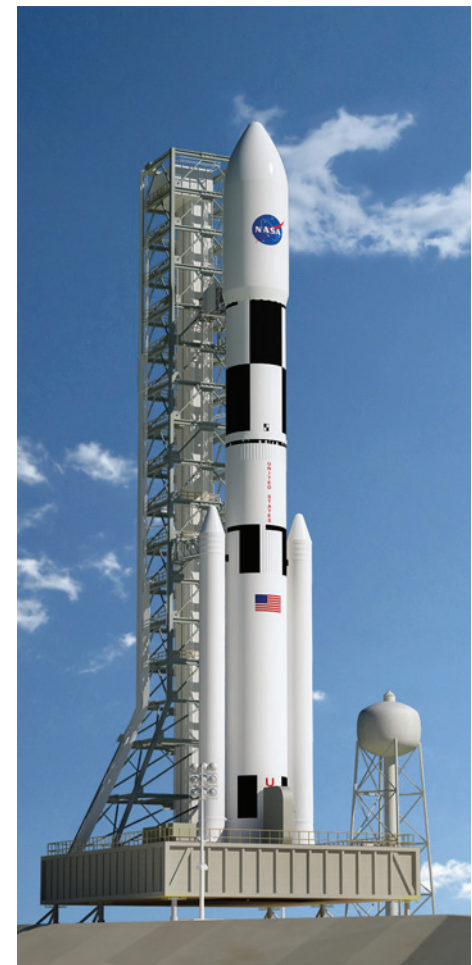
Three-Phase Booster Development Approach



Moving Forward from Initial to Evolved Capability



- ◆ **SLS is a national capability that empowers entirely new exploration for missions of national importance.**
- ◆ **Program key tenets are *safety, affordability, and sustainability*.**
- ◆ **SLS builds on a solid foundation of experience and current capacities to enable a timely initial capability and evolve to a flexible heavy-lift capability through competitive opportunities:**
 - Reduce risks leading to an affordable Advanced Booster that meets the evolved capabilities of SLS
 - Enable competition by mitigating targeted Advanced Booster risks to enhance SLS affordability and performance
- ◆ **The road ahead promises to be an exciting journey for present and future generations, and we look forward to working with you to continue America's space exploration.**



Advancing the U.S. Legacy of Human Exploration

